UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 14511

MSAS NO. 115

OVER THE

RED RIVER OF THE NORTH

DISTRICT 4 - CLAY COUNTY, CITY OF MOORHEAD

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 45)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 14511, Piers 3 and 4, were in good condition with no defects of structural significance observed. The channel bottom appeared to be stable with no evidence of significant scour or appreciable changes since the previous inspection.

INSPECTION FINDINGS:

(A) Random hairline to 1/16 inch wide vertical cracks were observed along the diaphragm of both piers, extending from the top of the diaphragm to the channel bottom.

(B) A minor accumulation of timber debris, consisting of 6 inch diameter and smaller branches was observed along the west side of Pier 4, extending from the channel bottom up 1 foot and up to 4 feet off the pier face.

(C) The channel bottom material consisted of soft clay and gravel with up to 1.5 feet of probe rod penetration.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 14511

Feature Crossed: Red River of the North

Feature Carried: MSAS No. 115

Location: District 4 - Clay County, City of Moorhead

Bridge Description: The bridge is a seven span structure consisting of a multiple steel beam superstructure supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and six reinforced concrete piers. The piers are numbered 1 through 6 starting from the west end of the bridge. The abutment and pier footings are supported by steel H-piles.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan

Date: August 20, 2007

Weather Conditions: Cloudy, 60° F

Underwater Visibility: Negligible/None.

Waterway Velocity: 0.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 3 and 4.

General Shape: The piers consist of two interior oblong rectangular shafts with rounded ends and two circular fascia columns, all supporting a common rectangular cap. The pier shafts and columns are connected with a continuous deep concrete diaphragm and are supported on footings founded on steel H-piles.

Maximum Water Depth at Substructure Inspected: Approximately 4.0 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap at the downstream end of Pier 4.

Water Surface: The waterline was approximately 31.1 feet below reference.
Waterline Elevation = 872.4.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 6

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code I/92

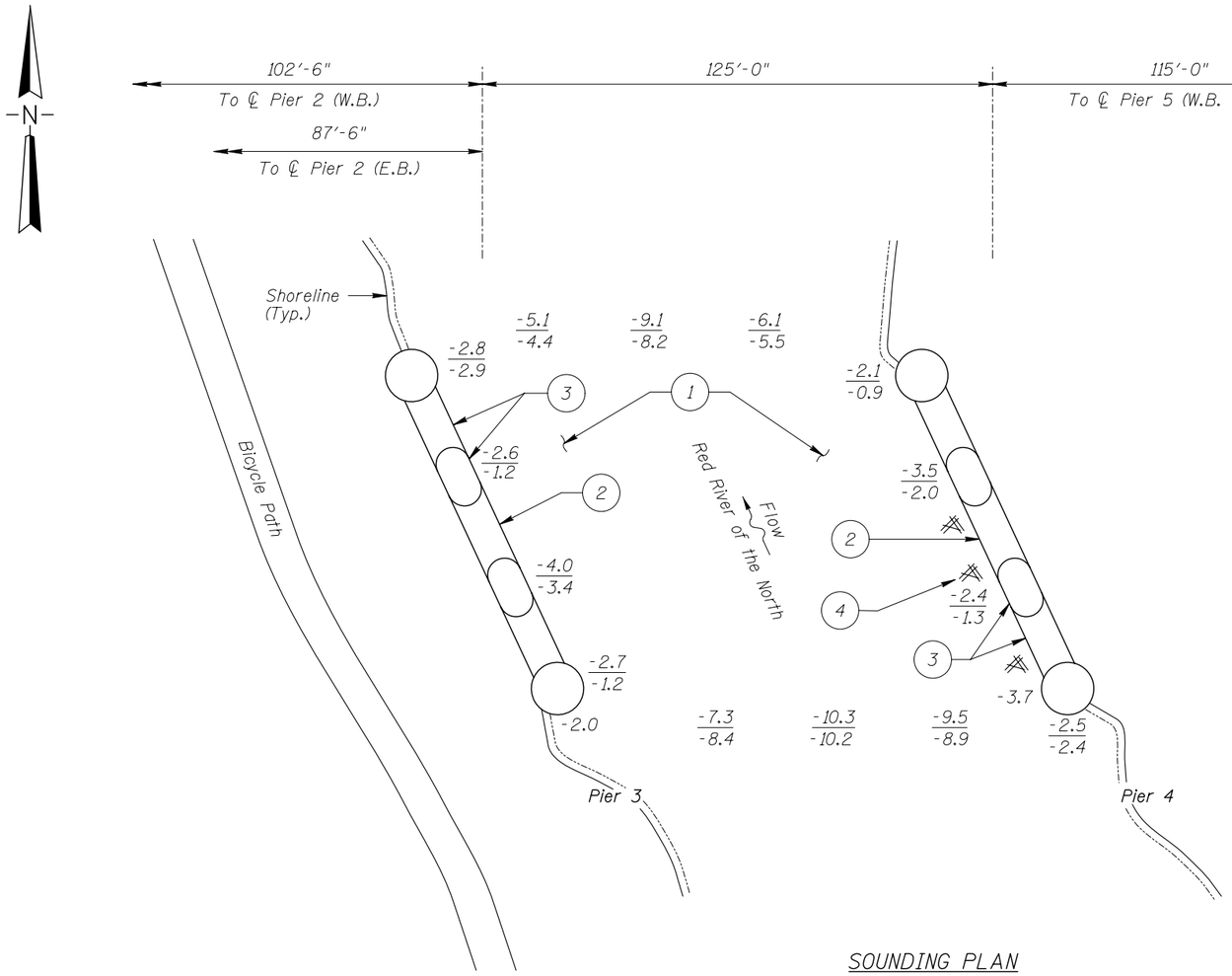
Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____Yes X No

Photograph 1. Overall View of the Structure, Looking North.

Photograph 2. View of Pier 3 and West Shore, Looking West.

Photograph 3. View of Pier 4 and East Shore, Looking East.



SOUNDING PLAN

GENERAL NOTES:

1. Piers 3 and 4 were inspected underwater.
2. At the time of inspection on August 20, 2007, the waterline was located approximately 31.1 feet below the top of the pier cap at the downstream end of Pier 4. This corresponds to a waterline elevation of 872.4.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

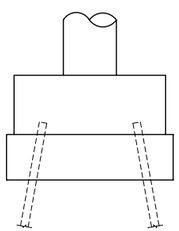
INSPECTION NOTES:

(1) The channel bottom material consisted of soft clay and gravel with up to 1.5 feet of probe rod penetration.

(2) Random hairline to 1/16 inch wide vertical cracks were observed on the diaphragm wall of both piers, extending from the top of the diaphragm to the channel bottom.

(3) A minor accumulation of timber debris, consisting of 6 inch diameter and smaller branches, was observed along the west side of Pier 4 extending from the channel bottom up 1 foot and up to 4 feet off the pier face.

(4) The concrete of the columns and diaphragm wall of Piers 3 and 4 was typically smooth and sound.



TYPICAL END VIEW OF PIERS

Legend

-2.0	Sounding Depth (8/20/07)
-5.2	Sounding Depth (10/28/07)

Note:

All soundings based on 2007 waterline location.

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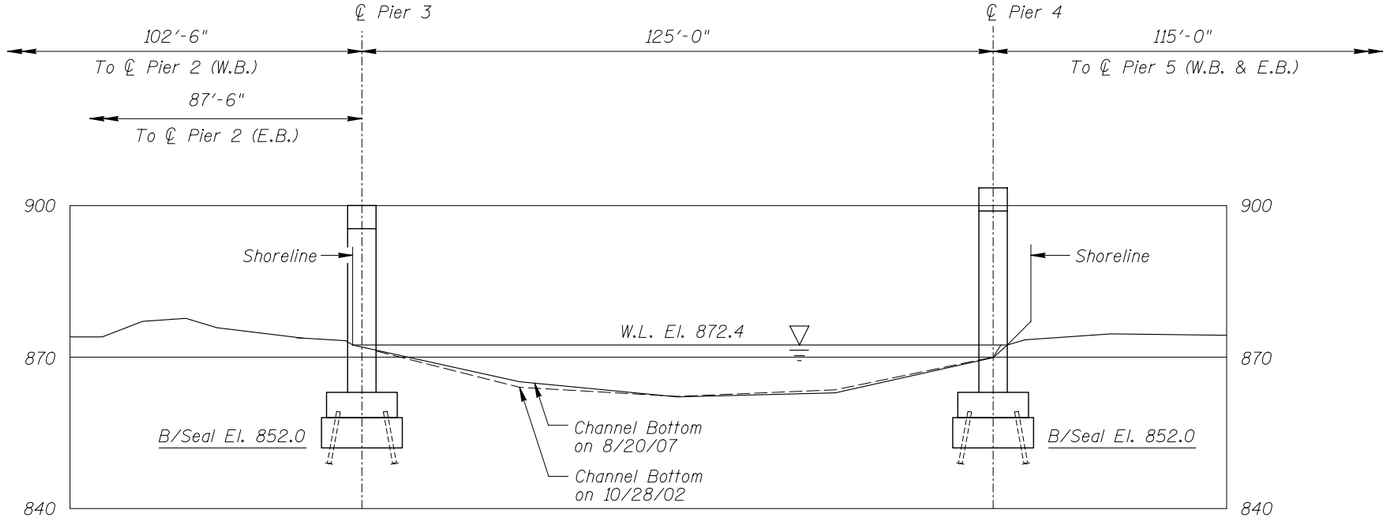
UNDERWATER BRIDGE INSPECTION

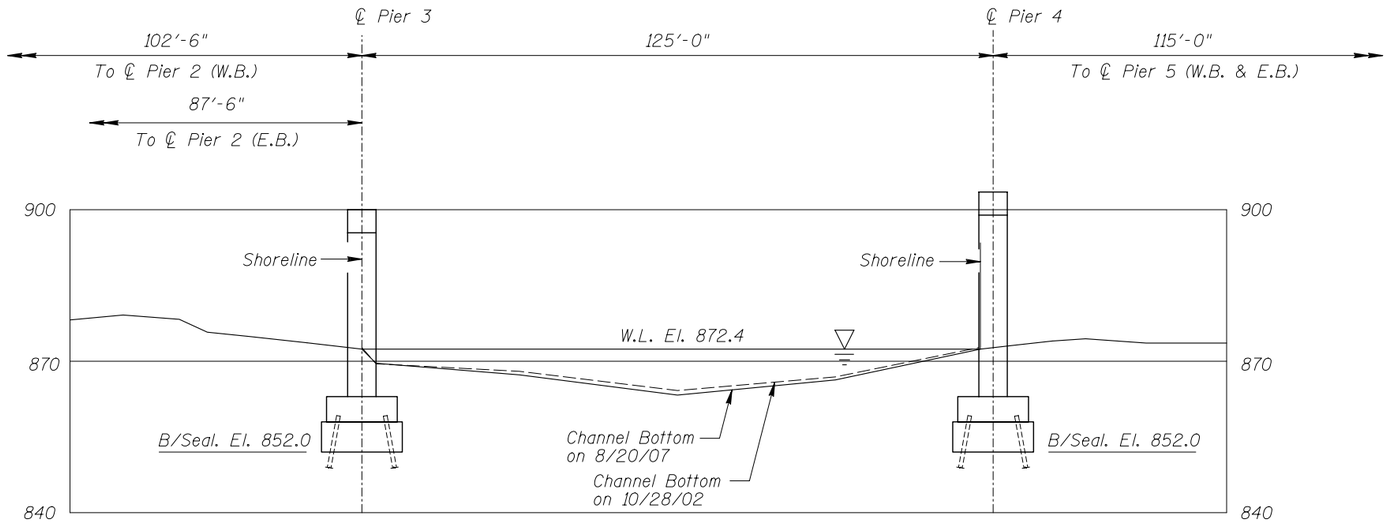
STRUCTURE NO. 14511
OVER RED RIVER OF THE NORTH
DISTRICT 4, CLAY COUNTY, CITY OF MOORHEAD

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: NTS
Code: 52210045		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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UNDERWATER BRIDGE INSPECTION

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DISTRICT 4, CLAY COUNTY, CITY OF MOORHEAD

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: 1"=30'
Code: 52210045		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 20, 2007
ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.
BRIDGE NO: 14511 WEATHER: Cloudy, 60°F
WATERWAY CROSSED: Red River of the North
DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR
_____ OTHER
PERSONNEL: John J. Loftus, Valerie Roustan
EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Camera
TIME IN WATER: 12:45 p.m.
TIME OUT OF WATER: 1:30 p.m.
WATERWAY DATA: VELOCITY 0.5 f.p.s.
VISIBILITY Negligible/None
DEPTH 4.0 feet maximum at Pier 3.
ELEMENTS INSPECTED: Piers 3 and 4
REMARKS: The concrete of the columns and diaphragm wall of Piers 3 and 4 was typically smooth and sound. Several random hairline to 1/16 inch wide vertical cracks were present in the diaphragm wall of both piers, extending from the top of the diaphragm to the channel bottom. A minor accumulation of timber debris consisting of 6 inch diameter and smaller branches was present at the west side of Pier 4. The channel bottom material was soft clay with some gravel and appeared stable.

FURTHER ACTION NEEDED: _____ YES X NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 14511
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.
WATERWAY CROSSED Red River of the North

INSPECTION DATE August 20, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 3	4.0’	N	7	N	9	N	7	7	6	6	N	6	7	N	N	N	N	N
	Pier 4	3.7’	N	7	N	9	N	7	7	6	6	7	6	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete of the columns and diaphragm wall of Piers 3 and 4 was typically smooth and sound. Several random hairline to 1/16 inch wide vertical cracks were present in the diaphragm wall of both piers, extending from the top of the diaphragm to the channel bottom. A minor accumulation of timber debris consisting of 6 inch diameter and smaller branches was present at the west side of Pier 4. The channel bottom material was soft clay with some gravel and appeared stable.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.